AMENDMENTS TO THE SPECIFICATION:

Please amend the paragraph beginning at page 1, line 12, as follows:

The ~~present invention~~ described technology relates to a developing device used in an image forming device such as a copying machine, a printer, and a facsimile machine employing an electro-photographic system, and relates to an image forming device.

Please amend the paragraphs beginning at page 3, line 22 through page 12, line 6, as follows:

~~The~~ One or more aspects of the present invention ~~has been devised in view of~~ address this situation. An object ~~of the present invention~~ is to provide a developing device in which arrangement of one end portion of a reflux plate is optimized in the vicinity of the outer periphery of a stirring roller so that reflux of developer is stabilized.

Another object ~~of the present invention~~ is to provide a developing device in which arrangement of one end portion of a reflux plate is optimized in the vicinity of the outer periphery of a stirring roller so that the rate of circulation of developer is enhanced.

Yet another object ~~of the present invention~~ is to provide a developing device in which the inclination angle of a reflux plate is optimized so that reflux of developer is stabilized.

Further, another object ~~of the present invention~~ is to provide a developing device in which arrangement of one end portion of a reflux plate is optimized in the vicinity of the outer periphery of a stirring roller so that mixing of flowed-back developer and supplied developer is improved.

Further, another object ~~of the present invention~~ is to provide a developing device in which small-grain diameter developer is used so that image quality is improved.

Further, another object ~~of the present invention~~ is to provide an image forming device in which image quality of an image formed on a sheet is stabilized.

A developing device according to ~~the present invention~~ a non-limiting embodiment is a developing device comprising: a stirring roller having stirring blades for stirring a developer; a developing roller for transferring the developer to an electrostatic latent image; a control member for controlling the amount of developer transferred to the electrostatic latent image by said developing roller; and a reflux plate for flowing back excess developer by controlling of said control member to said stirring roller; wherein one end portion of said reflux plate is disposed in the vicinity of the outer periphery of said stirring roller, and part of the developer stirred by said stirring roller flies toward said reflux plate, and is characterized in that said one end portion of said reflux plate is disposed at a position remote from said stirring roller over a distance greater than the maximum fly distance of the developer provided by rotation of said stirring roller.

A developing device according to the ~~present invention~~ embodiment is characterized in that said one end portion of said reflux plate is disposed above in the vertical direction of said stirring roller, and said maximum fly distance is the maximum fly distance in the vertical direction.

A developing device according to the ~~present invention~~ embodiment is a developing device comprising: a stirring roller having stirring blades for stirring a developer; a developing roller for transferring the developer to an electrostatic latent image; a control member for controlling the amount of developer transferred to the electrostatic latent image by said developing roller; and a reflux plate for flowing back excess developer by controlling of said control member to said stirring roller; wherein one end portion of said reflux plate is disposed in the vicinity of the outer periphery of said stirring roller, and is characterized in that said one end

portion of said reflux plate is disposed within a predetermined range from a position where a plane passing through the rotation center axis of said stirring roller and crossing said reflux plate at right angles intersects said reflux plate.

A developing device according to the ~~present invention~~ embodiment is characterized in that said one end portion of said reflux plate is disposed at a position where a plane passing through the rotation center axis of said stirring roller and crossing said reflux plate at right angles intersects said reflux plate.

A developing device according to the ~~present invention~~ embodiment is characterized in that an inclination angle of said reflux plate is larger than an angle of repose.

A developing device according to the ~~present invention~~ embodiment is characterized by further comprising a developer supplying portion from which the developer is supplied, wherein said stirring roller is disposed between said developer supplying portion and said developing roller, and said one end portion of said reflux plate is disposed in the vicinity of the outer periphery on said developer supplying portion side of said stirring roller.

A developing device according to the ~~present invention~~ embodiment is characterized in that said stirring roller stirs the developer containing magnetic powder having an average grain diameter of 65 μm or smaller and toner having an average grain diameter of 7.5 μm or smaller.

An image forming device according to ~~the present invention~~ a non-limiting embodiment is characterized by comprising a developing device according to above mentioned ~~invention~~ embodiment for developing an electrostatic latent, and an image forming unit for forming on a sheet an image developed by said developing device.

In ~~the present invention, in~~ a developing device in which one end portion of a reflux plate is disposed in the vicinity of the outer periphery of a stirring roller having stirring blades and in

which part of the developer stirred by the stirring roller flies toward the reflux plate, said one end portion of the reflux plate is disposed at a position remote from the stirring roller over a distance greater than the maximum fly distance of the developer provided by rotation of the stirring roller. Thus, even when the developer stirred by the stirring roller flies toward the reflux plate, since said one end portion of the reflux plate is remote from the stirring roller over a distance greater than the maximum fly distance of the developer, the developer does not reach said one end portion, and hence deposition of the developer is prevented.

In ~~the present invention~~ a non-limiting embodiment, one end portion of the reflux plate is disposed above in the vertical direction of the stirring roller having stirring blades, while said one end portion of the reflux plate is disposed at a position remote from the stirring roller over a distance greater than the maximum fly distance of the developer in the vertical direction. Thus, even when the developer stirred by the stirring roller flies toward the reflux plate, since said one end portion of the reflux plate is remote from the stirring roller over a distance greater than the maximum fly distance of the developer in the vertical direction, the developer does not reach said one end portion, and hence deposition of the developer is prevented.

In ~~the present invention, in~~ a developing device in which one end portion of a reflux plate is disposed in the vicinity of the outer periphery of a stirring roller, said one end portion of the reflux plate is disposed within a predetermined range from a position where a plane passing through the rotation center axis of the stirring roller and crossing the reflux plate at right angles intersects the reflux plate. Thus, since the amount of developer transferred to a control member for controlling the transferring amount to an electrostatic latent image increases when said one end portion of the reflux plate approaches the position where the plane passing through the

rotation center axis of the stirring roller crosses the reflux plate at right angles, the rate of circulation of the developer can be made to be larger.

In ~~the present invention~~ an aspect, one end portion of the reflux plate is disposed at a position where a plane passing through the rotation center axis of the stirring roller and crossing the reflux plate at right angles intersects the reflux plate. Thus, since the amount of developer transferred to a control member for controlling the transferring amount to an electrostatic latent image increases when said one end portion of the reflux plate approaches the position where the plane passing through the rotation center axis of the stirring roller crosses the reflux plate at right angles, the rate of circulation of the developer can approach the maximum.

In ~~the present invention~~ an aspect, an inclination angle of the reflux plate is set larger than an angle of repose at which accumulated developer remains stable without collapsing. Then, since the inclination angle is larger than the angle of repose, the developer is prevented from stably depositing on the reflux plate, and hence reflux of the developer is stabilized.

In ~~the present invention~~ an aspect, the stirring roller is disposed between the developer supplying portion and the developing roller, while one end portion of the reflux plate is disposed in the vicinity of the outer periphery on the developer supplying portion side of the stirring roller. Thus, since excess developer is flowed back from the reflux plate to the developer supplying portion side of the stirring roller, and mixing of the developer having been flowed back and the developer supplied from the developer supplying portion can be improved.

In ~~the present invention~~ an aspect, a small-grain diameter developer containing magnetic powder having an average grain diameter of 65 μm or smaller and toner having an average grain diameter of 7.5 μm or smaller is stirred by the stirring roller. When the small-grain diameter developer is used, image quality is improved. Nevertheless, developer of small grain diameter

aggregates easily and has a tendency that its fluidity becomes poor and hence causes instability in the circulation. However, ~~in the present invention,~~ as described above, the developer is prevented from depositing on the reflux plate, or alternatively the rate of circulation of the developer is improved, yet alternatively, mixing of the developer is improved. Thus, even when such small-grain diameter developer is used, circulation of the developer is stabilized.

In ~~the present invention~~ an aspect, ~~a~~ the developing device ~~according to the present invention~~ described above develops an electrostatic latent image. Then, an image forming unit forms the developed image onto a sheet. ~~In the developing device of the present invention,~~ The circulation of the developer is stabilized as described above, so that image quality formed on the sheet can be stabilized.

~~According to the present invention~~ In an aspect, one end portion of the reflux plate is disposed at a position remote from the stirring roller over a distance greater than the maximum fly distance of the developer provided by rotation of the stirring roller, so that the developer does not reach said one end portion, and hence deposition of the developer is prevented. This prevention of deposition of the developer stabilizes the reflux of the developer.

~~According to the present invention~~ In an aspect, one end portion of the reflux plate is disposed at a position which is located above in the vertical direction and which is remote from the stirring roller over a distance greater than the maximum fly distance of the developer in the vertical direction, so that the developer does not reach said one end portion, and hence deposition of the developer is prevented. This prevention of deposition of the developer stabilizes the reflux of the developer.

~~According to the present invention~~ In an aspect, one end portion of the reflux plate is disposed within a predetermined range from a position where a plane passing through the

rotation center axis of the stirring roller and crossing the reflux plate at right angles intersects the reflux plate, so that the amount of developer transferred to the control member increases, and hence the rate of circulation of the developer can be made to be larger.

~~According to the present invention~~ In an aspect, one end portion of the reflux plate is disposed at a position where a plane passing through the rotation center axis of the stirring roller and crossing the reflux plate at right angles intersects the reflux plate, so that the amount of developer transferred to the control member reaches the maximum, and the rate of circulation of the developer reaches the maximum.

~~According to the present invention~~ In an aspect, the inclination angle of the reflux plate is made to be larger than the angle of repose, so that the developer can not deposit stably on the reflux plate, and hence the circulation of the developer is stabilized.

~~According to the present invention~~ In an aspect, one end portion of the reflux plate is disposed on the developer supplying portion side of the stirring roller, so that excess developer is flowed back to the developer supplying portion side of the stirring roller. Thus, the mixing of the developer having been flowed back and the developer supplied from the developer supplying portion can be improved. This improvement in the mixing of the developer stabilizes image quality.

~~According to the present invention~~ In an aspect, by using small-grain diameter developer, image quality is improved. Further, even when such small-grain diameter developer is used, circulation of the developer can be stabilized as described above.

~~According to the present invention~~ In an aspect, a developing device in which circulation of the developer can be stabilized as described above is used, so that image quality of an image formed on a sheet can be stabilized.

The above and further objects and features ~~of the invention~~ will more fully be apparent from the following detailed description with accompanying drawings.

Please amend the paragraphs beginning at page 12, lines 14-16, as follows:

FIG. 2 is a sectional view showing the configuration of a developing device according to ~~the present invention~~ a non-limiting embodiment;

FIG. 3 is an enlarged view of the essential portion of a developing device according to ~~the present invention~~ a non-limiting embodiment;

Please amend the paragraph beginning at page 13, line 6, as follows:

FIG. 10 is a sectional elevation front view showing the configuration of ~~the essential~~ a portion of an image forming device employing a developing device according to ~~the present invention~~ a non-limiting embodiment.

Please amend the paragraph beginning at page 13, line 11, as follows:

~~The present invention is~~ One or more aspects are described below in detail with reference to the drawings showing embodiments. FIG. 2 is a sectional view showing the configuration of a developing device according to ~~the present invention~~ a non-limiting embodiment. The developing device comprises: a case 1 for storing binary developer; a stirring roller 7 having stirring blades 7a and stirring the developer inside the case 1; a developing roller 3 for transferring the developer to an electrostatic latent image carried on a photosensitive drum 2 and for developing the electrostatic latent image; a control member 4 controlling the transferring amount of the developer to the electrostatic latent image at midway to the developing roller 3; a

scraping member 5 facing the developing roller 3 with spacing of a second gap G2 larger than a first gap G1 formed between the developing roller 3 and the control member 4, controlling the layer thickness of the developer transferred to the first gap G1, and then scraping the developer; and a reflux plate 6 by which excess developer resulting from control by the control member 4 is flowed back to the stirring roller 7. In addition, the control member 4 and the scraping member 5 are formed in a length corresponding to that of the developing roller 3.

Please amend the paragraphs beginning at page 16, line 16 through page 18, line 23, as follows:

The control member 4 performs main electrostatic charging of the developer ~~under~~ for controlling the transferring amount of the developer at midway to the developing roller 3. The control member 4 ~~consists~~ can be formed of a nonmagnetic metal plate having a rectangular cross section, and periphery surface thereof faces the periphery surface of the developing roller 3 with spacing of the first gap G1. The control member 4 and the scraping member 5 ~~are composed~~ can be formed, for example, of similar materials such as to have approximately the same coefficient of linear expansion. Thus, even when curvature displacement occurs in the control member 4 and the scraping member 5 owing to a temperature change, variation of the first and the second gaps G1 and G2 can be limited at minimum.

The scraping member 5 scrapes the developer so as to perform preliminary electrostatic charging of the developer ~~under~~ for controlling the transferring amount (the layer thickness) of the developer transferred to the first gap G1 at midway to the developing roller 3. The scraping member 5 is formed integrally with the nonmagnetic reflux plate 6. The reflux plate 6 is located from the above portion of the developing roller 3 (the upper end portion, hereafter) to the above

portion of the stirring roller 7 (the lower end portion, hereafter) in an inclined manner such that the developing roller 3 side (the upper end portion) becomes high. An end portion on the developing roller 3 side of the reflux plate 6 is folded back toward the developing roller 3 side, so that a folded piece 6a is formed, and the folded piece 6a is made to be the scraping member 5.

Prior to a transfer of the developer to the first gap G1, the scraping member 5 scrapes the developer and thereby performs preliminary electrostatic charging of the developer. Thus, when the developer is a binary developer, a repulsive face acts between respective parts of excess developer generated by the control member 4, and thereby prevents the excessive developer parts from combining with each other. This achieves smooth circulation of the developer. Further, since the scraping member 5 and the reflux plate 6 are integrated with each other, they reinforce each other so that displacement of the scraping member 5 in the expanding direction of the gap caused by a drag generating when the developer is scraped can be reduced. In the example of FIG. 2, the scraping member 5 is formed ~~in~~ integrally with the reflux plate 6. However, the scraping member may be formed separately from the reflux plate.

The second gap G2, the first gap G1 (mm), and the width dimension Dm (mm) of the magnetic pole N2 are set up such that the following relation should hold substantially.

$$G1<G2\leq 0.8\times Dm$$

For example, preferably, the first gap G1 is made to substantially be 0.5 mm, while the second gap G2 is substantially made to be between 2.3 mm ~~or~~ and 3.2 mm. Since the magnetic pole N2 is disposed in the vicinity of the scraping member 5 while the width dimension Dm of the magnetic pole N2 substantially satisfies $G1<G2\leq 0.8\times Dm$, the magnetic flux density can be enhanced in the vicinity of the scraping member 5. Accordingly, preliminary charging can be efficiently performed. Further, the width dimension Dm of the magnetic pole N2 is substantially

made to be 4 mm as described above. However, this width dimension may be an appropriate dimension.

Further, the first gap G1, the second gap G2, the amount of the developer M1 (g/s/cm) transferred from the first gap G1, and the amount of developer M2 (g/s/cm) to be transferred to the second gap G2 are set up such that the following relation should substantially hold.

$$M2>(M1/G1)G2$$

Here, M1 and M2 are based on the passing amount for substantially 10 seconds in a portion where a length dimension of substantially 5 cm in the longitudinal direction (center axis direction of the developing roller 3) of the control member 4 and the scraping member 5. (M1/G1) is the passing amount (g) per unit length of the gap G1. By establishing (M2/G2)>(M1/G1), the control member 4 stably scrapes and contacts with the developer, so that the circulation amount by the preliminary electrostatic charging can be increased.

Please amend the paragraph beginning at page 19, line 13, as follows:

The first developer stagnation suppressing member 12, and the second developer stagnation suppressing member 13 ~~consist~~ can be formed of nonmagnetic materials such as metal or synthetic resin having a length corresponding to that of the developing roller 3. The first developer stagnation suppressing member 12 is disposed between the upper end portion of the reflux plate 6 and the upper wall of the case 1 remote from the reflux plate 6, and flows back excess developer smoothly to the reflux plate 6. Further, under surface of the first developer stagnation suppressing member 12, a plurality of protruding portions 12a that contact with the upper surface of the reflux plate 6 protrude with spacing in the longitudinal direction. Upward bending of the reflux plate 6 is regulated by the protruding portions 12a. As such, since the

protruding portions 12a contact with the reflux plate 6 and thereby suppress the displacement of the scraping member 5, displacement of the scraping member 5 in the expanding direction of the gap caused by a drag generating when the developer is scraped can be reduced. Here, the first developer stagnation suppressing member 12 shown in FIG. 2 is provided from the control member 4 to the upper end portion of the reflux plate 6. However, the length of the first developer stagnation suppressing member 12 from the control member 4 is not limited to a specific value. Further, the first developer stagnation suppressing member 12 may be integrated with the control member 4.

Please amend the paragraph beginning at page 28, line 24, as follows:

As ~~this invention~~ the aspects may be embodied in several forms without departing from the spirit of essential characteristics thereof, the present embodiments are therefore illustrative and not restrictive, since the scope of the invention is defined by the appended claims rather than by the description preceding them, and all changes that fall within metes and bounds of the claims, or equivalence of such metes and bounds there of are therefore intended to be embraced by the claims.